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10/692,291

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Anssi Ramo

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EXAMINER

WOZNIAK, JAMES S

ART UNIT

PAPER NUMBER

2655

DATE MAILED: 06/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/692,291

Applicant(s)

RAMO ET AL.

Examiner

James S. Wozniak

Art Unit

2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 23 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 11/21/04
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Objections*

1. **Claim 1** is objected to because of the following informalities: “the decoder” in lines 5-6 should be changed to --a decoder-- to provide proper antecedent basis.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. **Claims 1-5, 7-12, 15, 17, and 20** are rejected under 35 U.S.C. 102(b) as being anticipated by Lee et al (“*A Very Low Bit Rate Speech Coder Based on a Recognition/Synthesis Paradigm*,” 2001).

With respect to **Claim 1**, Lee recites:

Creating, based on the pitch contour data, a plurality of simplified pitch contour segment candidates, each candidate corresponding to a sub-segment of the audio signal (*Section V.A.*, *Page 486-487*);

Measuring deviation between each of the simplified pitch contour segment candidates and said pitch values in the corresponding sub-segment; selecting one of said candidates based on the measured deviations and one or more pre-selected criteria (*error and selecting candidates with error below a threshold amount, Section V.A., Page 486-487; and Fig. 5*); and

Coding the pitch contour data in the sub-segment of the audio signal corresponding to the selected candidate with characteristics of the selected candidate (*Section V, Page 486*).

With respect to **Claim 2**, Lee discloses:

The pitch contour data in the audio segment in time is approximated by a plurality of selected candidates, corresponding to a plurality of consecutive sub-segments in said audio segment, each of said plurality of selected candidates defined by a first end point and a second end point, and wherein said coding comprises the step of providing information indicative of the end points so as to allow the decoder to reconstruct the audio signal in the audio segment based on the information instead of the pitch contour data (*end points and coding, Sections V-V.A.; Page 486-487; Fig. 5; and decoder, Abstract; Fig. 1*).

With respect to **Claim 3**, Lee teaches the multiple pitch parameters per interval as shown in Fig. 5.

With respect to **Claim 4**, Lee teaches a maximum allowable contour approximation error threshold (*Section V.A., Page 486-487*).

With respect to **Claim 5**, Lee teaches that if a longest candidate has an acceptable approximation error, no additional endpoints, which would result in shorter segments, are utilized (*Section VA, Pages 486-487*). Lee also teaches coding based on the fewest number of endpoints needed to encode a pitch contour (*Section V-VB, Pages 486-488*).

With respect to **Claim 7**, Lee discloses a means for providing additional endpoints  
(*Section V.A., Page 486-487*).

With respect to **Claim 8**, Lee teaches the linear estimation of a pitch contour as applied to  
claim 1, which is related to speech coding (*Abstract*).

With respect to **Claim 9**, Lee shows a pitch contour approximation as a linear segment  
(*Fig. 5*).

With respect to **Claim 10**, Lee teaches a B-spline approximation for a smoothed  
approximation of a pitch contour (*Section V.A., Page 487*).

With respect to **Claim 11**, Lee recites:

An input end for receiving the pitch contour data (*Fig. 1*); and

A data processing module, responsive to the pitch contour data, for creating a plurality of  
simplified pitch contour segment candidates, each candidate corresponding to a sub-segment of  
the audio signal, wherein the processing module comprises (*F0 coding, Fig. 1*):

An algorithm for measuring deviation between each of the simplified pitch contour  
segment candidates and said pitch values in the corresponding sub-segment; and an algorithm for  
selecting one of said candidates based on the measured deviations and pre-selected criteria (*error  
calculation and selecting candidates with error below a threshold amount, Section V.A., Page  
486-487; and Fig. 5*).

With respect to **Claim 12**, Lee teaches a means for compressing an approximated pitch  
contour (*Section V, Page 486 and Section VI, Page 488*).

With respect to **Claim 15**, Lee teaches the decoder having a concatenation unit as shown  
in *Fig. 1*.

With respect to **Claim 17**, Lee teaches the pitch contour approximation encoder as applied to Claims 1 and 2. Lee also teaches the decoder as shown in Fig. 1 having a means for accepting data from an encoder and a unit concatenation module for reconstructing speech data.

**Claim 20** contains subject matter similar to Claim 17, and thus, is rejected for the same reasons.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al in view of Swaminathan et al (U.S. Patent: 5,704,000).

With respect to **Claim 6**, Lee teaches the pitch contour approximation means as applied to Claim 4. Lee does not specifically suggest comparing candidates having the same length and selecting the candidate with the minimum deviation, however Swaminathan teaches a means for selecting from a plurality of pitch candidates corresponding to pitch parameters of a specific pitch period (Col. 5, Line 14- Col. 48).

Lee and Swaminathan are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Lee with the means for comparing multiple pitch

candidates to an original speech signal for a single pitch contour interval as taught by Swaminathan in order to further account for pitch estimation errors caused by spurious contaminants and distortion (*Swaminathan, Col. 5, Lines 23-31*).

6. **Claims 13-14, 16, 18-19, and 21-24** are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al in view of Lumelsky (*U.S. Patent: 6,246,672*).

With respect to **Claims 13 and 14**, Lee teaches the pitch contour approximation encoder as applied to Claims 11 and 12. Lee also teaches the transmission of encoded audio data to a decoder (Fig. 1; and Page 486, Section V). Lee does not teach the storage of compressed audio data, however Lumelsky teaches a storage means coupled to an encoder for storing encoded audio data (*Col. 6, Lines 32-56*).

Lee and Lumelsky are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Lee with the means for storing encoded audio data as taught by Lumelsky to implement a user-initiated means for playback of encoded audio information (*Lumelsky, Col. 6, Lines 39-43*).

With respect to **Claim 16**, Lee teaches the pitch contour approximation encoding method as applied to Claim 1, but does not specifically suggest implementing that method as a computer program stored on a computer readable medium. Lumelsky, however, teaches storing an encoding method on a computer readable medium for the benefit of easily implementing an encoding method using a computer (*Lumelsky, Col. 18, Lines 51-65*).

With respect to **Claims 18 and 19**, Lumelsky teaches the storage repository as applied to Claim 13 and further shows a wireless communication channel and decoder for decoding received audio data from the repository (*Fig. 1*).

**Claims 21 and 22** contain subject matter similar to Claims 18 and 19, and thus, are rejected for the same reasons.

With respect to **Claim 23**, Lumelsky further teaches a mobile user terminal connected to a wireless network (*Fig. 1*).

With respect to **Claim 24**, Lee teaches the speech coding system utilizing piecewise linear approximation as applied to Claim 17. Lee does not specifically disclose a communication network having a plurality of base and mobile stations, however Lumelsky teaches such a communication network (*base stations and mobile terminals, Col. 8, Lines 17-60*).

Lee and Lumelsky are analogous art because they are from a similar field of endeavor in speech coding. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Lee with the communication network having multiple user terminals and base stations as taught by Lumelsky in order to implement a convenient communication medium for providing encoded audio content to a user upon request using a readily available wireless network (*Lumelsky, Col. 5, Lines 36-50, and Col. 6, Lines 32-56*).



***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Van Coile et al (*U.S. Patent: 5,592,585*)- teaches the estimation of an intonation contour using a piecewise linear curve.

Klejin (*U.S. Patent: 6,169,970*)- teaches a method for determining an optimal pitch contour by analyzing a plurality of trial slopes.

Gao (*U.S. Patent: 6,449,590*)- teaches an encoder that estimates a pitch contour for an interval using a linear segment.

Tammi et al (*U.S. Patent Publication: 2005/0071153*)- teaches a method for determining a piecewise linear delay contour.


8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632 and email is James.Wozniak@uspto.gov. The examiner can normally be reached on Mondays-Fridays, 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Doris To can be reached at (703) 305-4827. The fax/phone number for the Technology Center 2600 where this application is assigned is (703) 872-9306.

Art Unit: 2655

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology center receptionist whose telephone number is (703) 306-0377.

James S. Wozniak  
5/18/2005



DAVID L. OMETZ  
PRIMARY EXAMINER